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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/740,053	12/20/2000	Kiyonori Shiraki	NIT-244	5572

24956 7590 12/17/2003

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EXAMINER

BEACHAM, CHRISTOPHER R

ART UNIT PAPER NUMBER

2653

DATE MAILED: 12/17/2003

*B*

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/740,053

Applicant(s)

SHIRAKI ET AL.

Examiner

Christopher R. Beacham

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 31 October 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) 7 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 December 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some    \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 9.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Election/Restrictions***

Applicant's election without traverse of Group I, drawn to claims 1-6, in Paper No. 8 is acknowledged.

***Priority***

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

***Drawings***

Figures 2 and 3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

***Specification***

- The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.
- The disclosure is objected to because of the following informalities: On page 16, line 17, "lower readgap 13" should be --lower readgap 7--. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

*The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.*

1. Claims 2, 3, 5 and 6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- Claims 2 and 5 are unclear and confusing. The limitation of "the flat surface shape of the MR sensor layer and lead layer in the size smaller than the flat surface shape" is obscure in trying to determine the structural relationship.

- Claims 3 and 6 are unclear and confusing. The limitation of "an additional protective layer of lower readgap is included among said lower shield layer, filler material and lower readgap layer," is difficult to ascertain the structural relationship of the three elements.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

*A person shall be entitled to a patent unless –*

*(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.*

2. Claims 1 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Applicant's Admitted Prior Art (hereinafter AAPA) (pg. 3, lines 4-15; Fig. 2).

- Regarding claim 1, AAPA shows an integrated thin film head, comprising:

a lower shield layer (4) formed on a substrate;  
a lower readgap layer (7) formed on said lower shield layer (4);  
a MR sensor layer (1) formed on said lower readgap layer (7);  
a lead layer (2) joined with said MR sensor layer (1);  
an upper lead layer (3) formed partially in contact with said lead layer (2);  
an upper readgap layer (6) formed to cover said MR sensor layer (1), lead layer (2) and upper lead layer (3); and

an upper shield layer (5) formed on said upper readgap layer (6) wherein a part of the lead layer (2) in contact with the upper lead layer (3) is formed thinner than the part thereof not in contact with the upper lead layer (3) (see attached Fig. 2).

- Regarding claim 4, AAPA shows an integrated thin film head, comprising:  
an undercoat layer (not illustrated) formed on the substrate (pg. 3, lines 7-9);  
a lower shield layer (4);  
a filler material filling (41) the stepped area of said lower shield layer;  
a lower readgap layer (7) formed on said lower shield layer (4) and filler material (41);

a MR sensor layer (1) formed at the position facing to the opposing surface of a recording medium on said lower readgap layer (7);

a lead layer (2) joined with said MR sensor layer (1) in the reverse side to the opposing surface of a recording medium;

an upper lead layer (3) formed to extend in the reverse direction in contact with a part said lead layer (2);

an upper readgap layer (60 formed to cover said MR sensor layer (1), lead layer (2) and upper lead layer (3); and

an upper shield layer (5) formed on said upper readgap layer (6) wherein a part of said lead layer (2) not in contact with the upper readgap layer (6) is formed thinner than the part thereof in contact with the upper readgap layer (6) (see attached Fig 2).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

*(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.*

3. Claims 2 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (hereinafter AAPA) (pg. 3, lines 4-15; Fig. 2) as applied to claims 1 and 4 above and further in view of Shouji et al. (hereinafter Shouji) (US 5,907,459).

- Regarding claims 2 and 5, AAPA shows all the features except the lower shield layer is covered with the flat surface shape of the MR sensor layer and lead layer in a size smaller than the flat surface shape.

Shouji shows the lower shield (48) being covered with the flat surface of the MR sensor layer (62) and lead layer (58) in a size smaller than the flat surface shape in the depth direction (col. 4, lines 10-26; Fig. 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to shorten the length of the lower shield layer of AAPA so that the length of the lower shield layer is shorter than the combined lengths of the MR sensor layer and the lead layer as taught by Shouji.

The rationale is as follows: One of ordinary skill in the art at the time of the invention would have been motivated to shorten the length of the lower shield layer of AAPA so that the length of the lower shield layer is shorter than the combined lengths of the MR sensor layer and the lead layer as taught by Shouji in order to reduce the lead resistance and to suppress the heat generation. Therefore, the reliability of the magnetic head can be improved (Shouji; col. 3, lines 22-26).

4. Claims 3 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (hereinafter AAPA) (pg. 3, lines 4-15; Fig. 2) as applied to claims 1 and 4 above and further in view of Seagle (US 5,764,446).

- Regarding claims 3 and 6, AAPA shows all the features except an additional protective layer of lower readgap is included among said lower shield layer, filler material and lower readgap layer, and/or wherein an additional protective layer of upper readgap is included between said upper readgap layer and upper shield layer.

Seagle discloses a protective undercoat layer (320) formed on the substrate (100) comprising an insulative dielectric material such as alumina (col. 6, lines 33-36).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the lower and upper readgap layers of AAPA with an protective undercoat layer formed thereon as taught by Seagle.

The rationale is as follows: One of ordinary skill in the art at the time of the invention would have been motivated to provide the lower and upper readgap layers of AAPA with an undercoat layer formed thereon as taught by Seagle in order to minimize the chance of a short circuit occurring during the thin film head manufacturing process (Seagle; col. 3, lines 23-38).

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- a. Garfunkel et al. (US 6,570,743 B1) is cited to show a read head with high and low resistance lead layers.
- b. Zhu (US 6,453,542) is cited to show a method for fabricating balanced shield connections for noise reduction in MR/GMR read heads.
- c. Hayakawa (US 6,252,749) is cited to show thin film magnetic head having a gap layer with improved thermal conductivity.
- d. Pinarbasi (US 6,219,207) is cited to show read sensor having high conductivity multiplayer lead structure with a molybdenum layer.
- e. Kanamine et al. (US 5,792,546) is cited to show a magneto-resistive head and method of producing the same.



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f. Gill et al. (US 5,653,013) is cited to show two thermal single stripe orthogonal MR heads.

g. Masuda et al. (US 3,731,007) is cited to show a magnetic head having a magneto-resistive bridge circuit.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher R. Beacham whose telephone number is (703) 605-4256. The examiner can normally be reached on M-F, 8: 00 am-5: 30 pm.

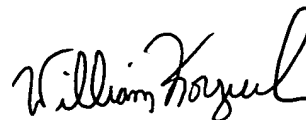
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Korzuch can be reached on (703) 305-6137. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-0377.

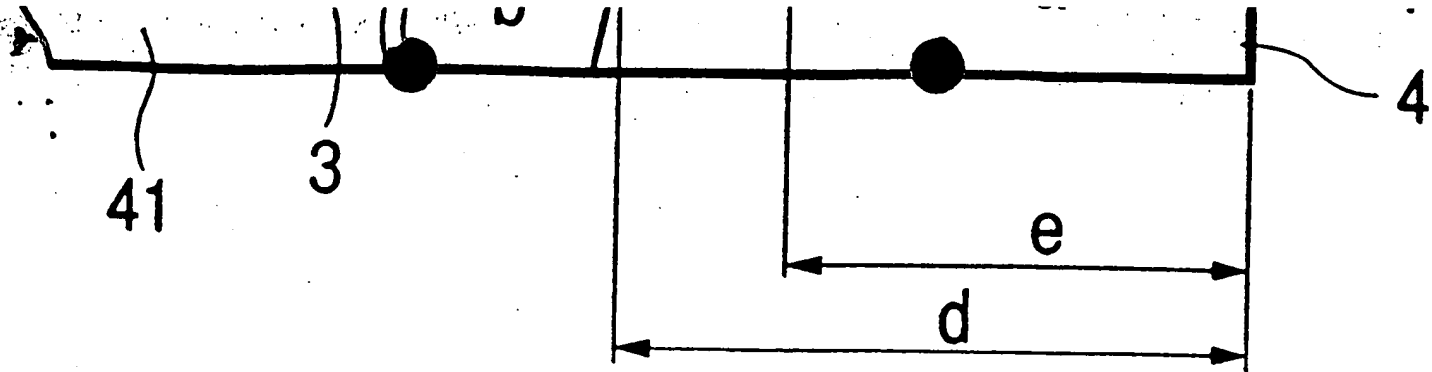


Christopher R. Beacham  
Patent Examiner  
Art Unit 2653

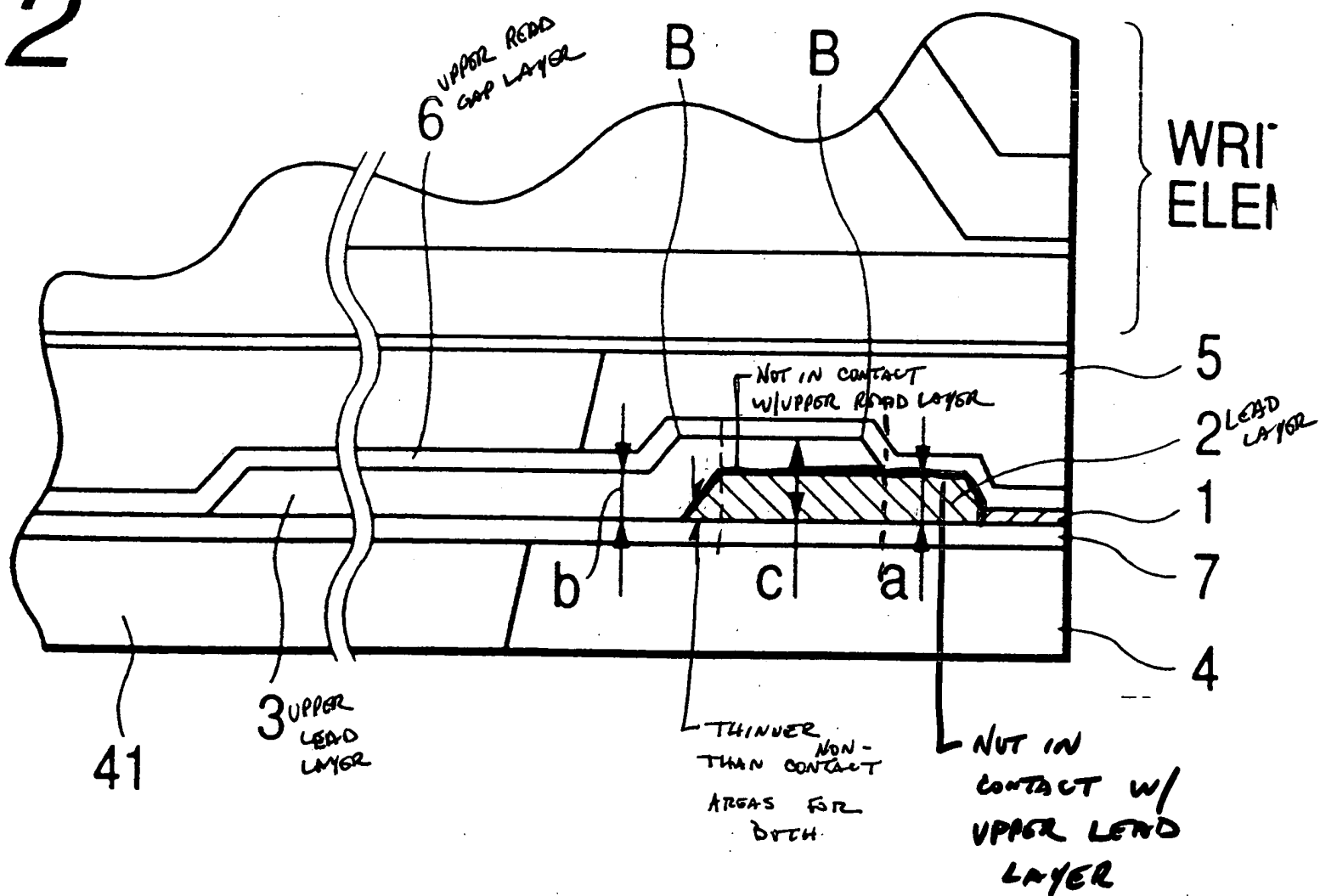
December 12, 2003



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